RHETORICAL FUNCTIONS IN THE INTRODUCTION SECTION OF ENGLISH RESEARCH ARTICLES BY NON-NATIVE SPEAKERS

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ABSTRACT

The aims of the study are to examine rhetorical functions in the Introduction, section and to find out whether rhetorical functions employed by non-native speakers have been or have not been conformed to the principles of writing introduction in a research article. The data of this study were collected from a number of science journals written by lecturers of five state universities. As the data belonged to one type of papers, Genre Analysis was employed. The results indicate that majority of the English research articles in the Introduction section by non-native speakers have not met the criteria or principles suggested by the experts representing Anglophone scientific work which has so far still dominated the publication of all scientific information written in English. In order to improve academic writing skill, we should introduce the principles of writing scientific journals to the students of higher education as early possible; let's say, starting from the first year of study.

Keywords: rhetorical functions, genre analysis, research articles, non-nativespeakers

A. INTRODUCTION

Introduction section in an academic essay or research article is an important part since it should attract the reader. For a novice writer writing introductory part for an essay or scientific article can be quite difficult; he or she sometimes does not know what to include in the introductory part. In general, writing introduction of essays is less complicated than that of research articles since the elements or rhetorical functions contained in essay are not so numerous or complicated as those in research articles. For instance, in an essay the writer is only required to introduce the topic and a thesis sentence and in order to attract the reader, the essay writer may use several introductory devices such as back ground information, anecdotes, pertinent statistics provocative questions, an appropriate analogy (Troyka, 1987: 107; Oshima, 1990 : 101; Smalley and Hank 1982 : 119). The writer is not required to include elements or aspects as many and complicated as in research articles.

Different from writing essays in which the ideas may, to some extent, derive from the writer's general knowledge or schemata , writing research articles, i.e. a research report may take a long process and time since the writer should take several steps prior to the research report writing. According to Swales and Feak (1994 : 215) research articles can be broadly classified into two types : (1) empirical or IMRD (Introduction-Methods-Results-Discussion) papers, (2) non-empirical papers. For instance, astrophysics is non-empirical; it is impossible to do

experimentation in such a field. Accordingly, astrophysics tends to publish logical argumentation papers that contain a general-specific structure. This form of argument moves typically from known principles, to observations, and then to equations designed to account for the observed phenomena. This kind of paper can be common in theoretical physics, in mathematics, and in those fields (economics, biostatistics, engineering) that use computer modeling. In such "theory papers", the standard Introduction-Methods-Results-Discussion (IMRD) pattern used for most research papers does not apply.

There are several terms used for the elements contained in the Introduction section for research articles. In the context of my study, the elements contained in the Introduction section of research articles are called "rhetorical functions". Rhetorical functions may refer to "communicative moves" (Swales,1981), "generic structures" (Samraj, 2002: 40), and "generic moves" (Bunton, 2002: 57). According to Trimble (1985 : 69) rhetorical functions in EST discourse may refer to "fundamental parts of the organization of scientific and technical information". They may take in the forms of paragraph development methods such as description, narration, classification, exemplification, etc.

The work of Swales (1981) on article introductions is considered a pioneer of genre analysis. He proposes a system of analysis which categorizes the discourse units found in the Introduction section of research articles into four communicative moves and his system of analysis is often called "move analysis." Model of Swales' analysis was adapted by many researchers especially those who deal with research papers, dissertations, journal articles, etc. In his research Swales collected 48 articles on Introduction in scientific research papers covering three majors: 16 'hard science' articles, 16 Biology/Medicine articles, and 16 social sciences articles (education, management, and language). The research results show that the Introduction articles contain repeated patterns and are similar to one another. And then those repeated patterns were coined by Swales as a system of rhetorical or discourse analysis called "Move Analysis". In the Introduction of scientific articles there are four communicative 'moves' :

Move 1: Establishing the field
- (a) by asserting significance, or
- (b) by stating current knowledge

Move 2 : Summarizing previous research
- (a) using a strong author-orientation, and/or
- (b) using a weak author-orientation, and/or
- (c) using a subject-orientation

Move 3 : Preparing for present research
- (a) by indicating a gap in previous research, or
- (b) by raising a question about previous research

Move 4 : Introducing the present research
- (a) by stating the purpose, or
- (b) by outlining present research

The model described above could no longer accommodate longer introductions as shown by some analysts like Lopez (1982), Bley-Vroman and

Selinker (1984), Crookes (1986) who found difficulty of separating Move 1 (Establishing the field) and Move 2 (Summarizing previous research). This was due to the increasing practice of spreading references throughout the introduction section (Jacoby, 1986). Then Swales (1990) revised his model called Create a Research Space (CARS) which was more flexible to accommodate more aspects in the longer introduction articles as shown in the following figure .

Move 1 Establishing a territory
Step 1 : Claiming centrality
and /or
Step 2 : Making topic generalization (s)
and/or
Step 3 : Reviewing items of previous research

Move 2 Establishing a niche
Step 1A : Counter-claiming
or
Step 1B : Indicating a gap
or
Step 1C : Question-raising
or
Step 1D : Continuing a tradition

Move 3 Occupying the niche
Step 1A : Outlining purposes
or
Step 1B : Announcing present research
Step 2 : Announcing principal findings
Step 3 : Indicating RA structure

Apart from the research described above, a number of Indonesian scholars have also done research in the field of academic or scientific writing. They examined rhetorical patterns of student's essays, articles in the newspapers, journal research articles. For instance, Basthomi (2006) explored the rhetoric of introductions to research articles (RAs) written in English by Indonesians, Anwar (2010) examined the rhetorical patterns in the introduction and discussion sections of journal articles written by native and non-native speakers, Mirahayuni (2001) compared the structures of research articles written by native English and native Indonesian writers, Kartika (1997) dealt with English newspapers articles written by Indonesian individuals and English native writers, and Haryanto (1999) analyzed essays written by students majoring in English at the Postgraduate program, the State University of Malang.

From the studies described above, it can be summed up that each research done by non-native speakers of English (Indonesian scholars) only deal with the journal articles in the field of language teaching or students' essays; none of them deals with science journal articles or EST (English for Science and Technology). Accordingly, our research topic is quite significant of executing a study on organizational (rhetorical function) features in science journal articles by non-native speakers. In other words, the

present study is an extension of what the native English and non-native have done such research so far. And the aims of this study are to examine the rhetorical functions in the Introduction section of research articles (i.e. science journal articles by non-native speakers) and to see whether rhetorical patterns or functions employed by the non-native speakers (i.e. Indonesian engineering lecturers) have been or have not been conformed to the principles of writing introduction in a research article.

B. RESEARCH METHODS

This research dealt with a number of English science journal articles written by non native speakers (Indonesian lecturers from several engineering faculties). We collected 20 journal articles from five state universities/institutes : UNDIP Semarang, UI Depok Jakarta, UGM Yogyakarta, ITB Bandung and ITS Surabaya and four articles for each institution. We deliberately chose those five universities as they were plotted to be world class universities; they were granted some funding from Directorate General of Higher Education (DIKTI) to improve human resources, i.e. conducting international seminars and research for international journal publication including e-journal. Taking part in publishing articles for international journal is highly competitive as the contributors (university lecturers) are required to have a good command of English, especially in written English. Compared to neighboring universities such as Malaysian, Singaporean, Korean, Japanese universities, Indonesian universities are relatively still left behind in taking part for international journal publication. Therefore, the research on academic writing is worth conducting in order to find out the level of the Indonesian lecturers' English competence especially in academic writing skill.

The articles could be grouped as English for Science and Technology (EST) since they were collected at random from several engineering majors : articles I-IV/UNDIP (civil engineering, electrical engineering, chemical engineering, and architecture), articles V-VIII/UGM (civil engineering, mechanical engineering, chemical engineering, and architecture), articles IX-XII/UI (electrical engineering, chemical engineering, metallurgy and material engineering, industrial engineering), articles XIII-XVI/ITB (mechanical and aero space engineering, civil and environmental engineering, electrical engineering, and chemical engineering), and articles XVII-XX/ITS (mechanical engineering, electrical engineering, chemical engineering, and architecture). For ease of reference, we would refer to the data as (e.g. articles I-UDP, V-UGM, IX-UI, XIII-ITB, XVII-ITS etc.) meaning it was written by UNDIP lecturers for UDP, and by UGM, UI, ITB, ITS lecturers.

Having selected the articles, it was necessary for us to outline the method of analysis. It would be a genre-based analysis, as it was only concerned with one type of papers (introduction section). Swales (1985) defines "genre" as follows : (1) A genre is a recognized communicative event with a shared public purpose and with aims mutually understood by the participants within that event; (2) A genre is within variable degrees of freedom structured and standardized in terms of positioning, form and intent.

Analysis of the data (20 articles) focused on rhetorical functions by applying Swales' "move analysis" which contain three main moves and several optional steps under the main moves (see the Figure, p. 4). The next step was to select and classify the article introductions as the data based on the majors, i.e. civil engineering, mechanical engineering, electrical engineering, chemical engineering, and architecture. Based on the selection, the collected data were used as the analysis materials. After the selected data were collected, the next step was to

analyze the texts focusing on the macro structure. Each article was analyzed in detail so that it could be seen whether the discourse structure (rhetorical functions) written by the Indonesian lecturers (non-native speakers) were already in line with the principles of writing Introduction. In other words, we would be able to find out the strengths and weaknesses of the sample articles written by non-native speakers. In addition, we may be able to find out the strengths or weaknesses of non-native speakers in writing in English and the research results can be beneficial for the development of EAP program for lecturers plotted to study abroad, especially in the English speaking countries.

C. RESULTS AND DISCUSSION

- Move Analysis

The updated Swales' Moves (1990) is more complicated than the previous one (1981) since each move of the three main moves contains sub-moves : Move 1 consists of three sub-moves (Steps 1, 2, and 3), Move 2 four sub-moves (Steps 1A, 1B, 1C, and 1D), Move 3 four sub-moves (Steps 1A, 1B, 2, and 3). Since the choice of the sub-moves is optional (and/or) we will only count the main moves; the total number of moves (TOM) does not represent whether the moves are complete or not so we add C (complete) or IC (Incomplete) meaning that when the Introduction section contains the three main moves it will be considered complete (C); on the other hand, when it does not contain the three main moves it will be considered incomplete (IC).

Moves Occurrence Found in the Introduction Section of the 20 Papers

No of Papers		Move 1			Move 2				Move 3				TOM
		S 1	S 2	S 3	S1A	S1B	S1C	S1D	S1A	S1B	S2	S3	
UDP	I -NI	v	-	v		v			v				4C
	II - NI	v	-	v		v			v				4 C
	III - I	v	-	v		v			v				4 C
	IV - I	v	-	-		v			-				2 IC
UGM	V - I	v	-	v		v			v				4 C
	VI - I	v	-	v		v			-	v			4 C
	VII - I	v	-	v		v			v				4 C
	VIII - I	v	v	-		v			v				4 C
UI	IX - NI	v	v	v		-			-				3 IC
	X - I	v	-	v		v			v				4 C
	XI - I	-	v	v		v			-				3 IC
	XII - I	-	v	v		-			v				3 IC
ITB	XIII - NI	-	v	v		-			v				3 IC
	XIV - NI	v	-	v		-			-	v			3 IC
	XV - NI	v	-	v		-			-			v	3 IC
	XVI - I	-	-	v		v			v				3 C
ITS	XVII - I	v	-	v		-			v				3 IC
	XVIII - NI	v	-	v		-			-		v		3 IC
	XIX - I	v	-	v		v			v				4 C
	XX - NI	v	-	v		-			v				3 IC

Notes :
I = IMRD papers; NI = NON-IMRD papers

Move 1: Establishing a territory
S1 (Step 1) : Claiming centrality
S2 (Step 2) : Making topic generalization (s)
S3 (Step 3) : Reviewing items of previous research

Move 2: Establishing a niche
S1A (Step 1A) : Counter claiming
S1B (Step 1B) : Indicating a gap
S1C (Step 1C) : Question raising
S1D (Step 1D) : Continuing a tradition

Move 3 : Occupying the niche
S1A (Step 1A) : Outlining purposes
S1B (Step 1B) : Announcing present research
S2 (Step 2) : Announcing principal findings
S3 (Step 3) : Indicating RA structure

TOM (Total of Moves) includes main and sub-moves.
C (Complete) means the Introduction section contains the three main moves (1, 2, 3). IC (Incomplete) means the Introduction section does not cover the three main moves (1, 2, 3).

In the table above (p. 9) it can be seen that of the 20 papers, only 12 papers contain complete move and the rest (8 papers) do not. Seen from each move, 1 paper (UI-IX) contain complete steps (1, 2, 3) in Move 1 and the rest do not. Meanwhile, in Move 2 the 19 papers only contain one step (Step 1B: indicating a gap); none of the paper authors choose Steps 1A,1C, or 1D which seem to be unfamiliar to them. Similarly, in Move 3 thirteen papers in the Introduction section contain Step 1A : outlining purposes; only four papers have different steps: paper VI-UGM and XIV-ITB use Step 1B (announcing present research), paper XVIII-ITS Step 2 (announcing principal findings), and paper XV-ITB Step 3 (indicating RA structure) while the rest (3 papers) do not contain Move 3.In terms of the organization, the data (20 papers) can be classified into two types of paper : IMRD (Introduction-Methods-Results-Discussion) and Non-IMRD.

The 12 papers belonging to empirical (having IMRD pattern) are III-UDP, IV-UDP, V-UGM, VI-UGM, VII-UGM, UGM-UGM, X-UI, XI-UI, XII-UI, XVI-ITB, XVII-ITS, XIX-ITS, and the rest (8 papers) can be classified as Non-IMRD papers. It can be seen from the table (p. 9) that IMRD papers have more moves than Non-IMRD papers. Of the 12 papers, only 4 papers do not have complete moves (30%), while in Non-IMRD papers 4 out of 8 papers have no complete moves (50%). In the 8 Non-IMRD papers, four papers come from electrical engineering, and two from civil engineering, one from mechanical engineering, and one from architecture.

Move 1 consisting of three steps (1, 2, 3) are employed for most of the data (20 papers). Swales (1990) defines Step 1 (Claiming the Centrality) as follows : " an appeal to the discourse community whereby members are asked to accept that the research to be reported is part of a lively, significant or well established research area. A centrality claim can be expressed in different ways: (1) interest or importance; (2) central character of the issue; (3) there are many other investigators active in the area."

Since there are three ways in Step 1, the choice of sub-moves in the data can be divided into three groups. In the first group 14 authors chose the first way

(claim of interest or importance) and the claims are put in the first sentence of paragraph 1, and only two authors (IV-UDP and VIII-UGM architecture) state their claims at the end of the first paragraph. Meanwhile, in the second group only two authors (VI-UGM, XVII-UI) chose the second way (central character of the issue) and in the third group two authors (XVIII-ITS, XIX-ITS) also chose the third way (referring to many other investigators). It is likely that many authors in the data are not familiar with the second and third ways in Step 1. The following are examples of Step 1 put at the beginning and at the end of the first paragraph and the choice of second and third ways.

The problems associated with thermally induced stresses in concrete at early ages have received increasing attention from researchers world wide in recent years. These stresses occur in freshly placed concrete as a result of several volume changing mechanisms mainly due to the early thermal effect and shrinkage (Harrison, 1991). Two active mechanisms producing self-induced stresses in immature concrete have been identified as a result of thermal and non thermal deformations. The thermal deformation is caused by heat of hydration, whereas non-thermal deformation occurs as a result of shrinkage or swelling. **(V-UGM)**

Wahab (1992) defines tourism as the movement of people to destinations outside their normal places of work and residence, the activities undertaken during their stay in these destinations, and the facilities created to cater to their needs. It is essential to define one of the major components of tourism which is the tourist. "Tourist" is derived from the term "tour" which according to *Webster's International Dictionary* (1961: 2417), means "a journey at which one returns to the starting point; a circular trip usually for business, pleasure or education during which various places are visited and for which an itinerary is usually planned". *The Oxford English Dictionary* (1993:190) defines tourist as "one who makes a tour or tours; especially one who does this for recreation; one who travels for pleasure or culture, one who visits a number of places for their objects of interest, scenery or the like." It is useful to acknowledge that tourism development can be a capital-intensive undertaking, especially in terms of the provision of accommodation facilities and man-made recreational facilities. **(IV-UDP)**

- The second way in Step 1 (Central character of the issue)

It is well known that ceramic materials generally exhibit excellentproperties such as high melting point, good high temperature strength, high Young's modulus, high hardness, good wear and corrosion resistance, relatively low coefficient thermal expansion (CTE) and thermal diffusivity, and low density. (VI-UGM, 1st sentence in the first paragraph)

- The third way in Step 1 (Referring to many other investigators)

Since the discovery of the titanium silicate-1 activity in the epoxidation of terminal alkene by aqueous hydrogen peroxide [1], the structure, properties catalytic activities of the titanium-containing materials, such as TS-1 [1-3], Ti-beta [4, 5], Ti-MCM-41[6, 7] and Ti-containing amorphous silica [8]have been widely investigated. (XIX-ITS; first sentence in the first paragraph)

Of the three Steps in Move 1, it seems that Step 2 is the least familiar or favorite for the authors in the data. As can be seen in the Table (p. 9), 16 authors employed Step 1, 5 authors Step 2, and 18 authors Step 3. The reason for not employing Step 2 (Making topic generalization) is not surprising since such a choice is much more difficult to do

than the other two steps (Step 1 and Step 3). In general, referring to writing skill, making generalization for an issue is one of the hardest writing skills for non-native speakers. This is in line with the research conducted by Hinkel (2004: 14-16). In his research he examined the ways in which speakers (students) of seven languages (English, Chinese, Japanese, Korean, Indonesian, Vietnamese and Arabic) employ tense and the passive voice in their L2 academic essays. The results show, in spite of having advanced level of English and relatively high scores of TOEFL, the NNS students still find difficulty in making 'generalization'. With regard to the differences between NNS and NS essays, he states as follows :

> The argumentation / exposition prose in the NNS essays, with the exception of that of NS and Arabic speakers, relied heavily on the recounts of past- time events, experiences and a preponderance of narratives. … In fact, (in a NNS essay) the writer's experience is not generalized to other similar situations, and the text does not contain generalizable present tense constructions. … A NS essay similarly argues for conducting classes in a serious rather than entertaining manner. However, the NS text includes generalizable observations, structured in the present tense. (p. 16)

According to Swales (1990), Step 2 in Move 1 (Making a topic generalization) represents a more neutral kind of general statement than Step 1. Step 2 can be grouped into two kinds of statement : about knowledge or practice, or statement about phenomena. The following are examples of the two kinds of statement found in the data :

1. The international context of Engineering Education has gained tremendous momentum, especially, over the last decade of the 20th century. With the globalization of world-wide economy, the enhancing internationalization of universities, and the spread of inter-university credit exchange systems, many universities are now tying student exchange agreements with universities abroad and operating short-term study programmed. (IX-UI; statement about phenomena)

2. The utilization of renewable energy as an alternative to fosil (sic) energy has been promoted all around the world, including Indonesia. (XIII-ITB; statement about practice)

Step 3 (Reviewing Items of Previous Research) in Move 1 is employed by most of the authors. Of the 20 papers only 2 authors majoring in Architecture did not employ Step 3. Step 3 which is obligatory is closely related to Move 2 (Establishing a niche) S1B (Indicating a gap). According to Swales and Feak (1994 : 243), the Introduction sections of Research Papers (RPs) typically has a rhetorical pattern called the create-a-research-space (or CARS) model. The authors of RPs have to compete for research space and for readers. In this Introduction pattern, the work of others and/or what is known about the world is primary, and your own work is secondary. The two Introduction sections in Architecture (IV-UDP and VIII-UGM) did not refer to previous research (CARS) but they employed Step1B (indicating a gap) in Move 2. To us, this is quite unusual since a research gap can be identified after reviewing several items of previous research. For instance, in IV-UDP the authors in their Introduction section only refer to the definition of "tourism" from

Wahab (1992), Webster's International Dictionary (1961:2417), The Oxford English Dictionary (1993:190), and he mentioned Azero Torre who mentioned about the basic concept of waterfront. However, the authors of IV-UDP employed Move 2 Step1B (Indicating a gap) by stating : " Such conditions indicate, that the income that may be derived from this sector is quite limited. In the same manner, the contribution of the tourism industry to both regency and regional development is relatively small." This statement is not likely based on the review of previous studies.

Similarly, the author of VIII-UGM did not employ Move 1 (Establishing a territory) Step 3 (Reviewing Items of Previous Research). In the Introduction section, he only described the location and population of Parangtritis as a tourist destination and gave a brief narration of the Sultan of Yogyakarta and the Ratu Kidul, the Southern Goddes. And then he stated the research gap by stating : "The growth of Paratritis settlements show it's very uncontrollable situation since May 1998."

Step 3 (Reviewing Items of Previous Research) in Move 1 is worth noting since it can show the knowledge depth in the chosen topic. According to Weissberg and Buker (1990:41), the review of literature (previous research) serves three important functions as follows:

> First, it continues the process started in Stage 1 of giving your readers background information needed to understand your study. Second, it assures your readers that you are familiar with the important research that has been carried out in your area. Third, it establishes your study as one link in a chain of research that is developing and enlarging knowledge in your field.

In Move 2 there are four options : Step1A (Counter claiming), Step1B (Indicating a gap), Step1C (Question raising), and Step1D (Continuing a tradition). From the Table (p. 9), it can be seen that most of the papers chose Step IB (Indicating a gap), and eight papers did not contain Move 2 at all (IX-UI, XII-UI, XIII-ITB, XIV-ITB, XV-ITB, XVII-ITS, XVIII-ITS, and XX-ITS). Of the eight papers, five are classified as IMRD papers and three as Non-IMRD papers. It seems that most of the authors are not familiar with three other options (S1A, S1C, and S1D) since they only chose Step 1B (Indicating a gap). Various lexical signals are employed in Move 2 Step 1B such as adversative connectors (however, despite, conversely, therefore, thus, meanwhile, etc.), lexical negations (poor in process, time consuming, reduce, uncontrollable, remarkably few data available, relatively small, not well understood, relatively expensive, etc.). The following are some instances of Step1B (Indicating a gap) :

1. Meanwhile the rigid porous materials such as carbon molecular sieves and zeolite are poor in process ability and difficulties in forming defect-free membranes for practical applications in spite of their superior gas separation properties. (III-UDP)

2. However, to best of the author's knowledge, thermal diffusivity of zirconia-matrix composites reinforced with iron has not been observed and reported. (V-UGM)

3. The procedure of conventional tension testing is usually time-consuming and unreasonable, particularly for thin specimen. (XI-UI)

4. However, the addition slightly reduce the catalyst's conversion. (XIX-ITS)

In Move 3 (Occupying the niche) there are four options : Step 1A (Outlining purposes), Step 1B (Announcing present research, Step2 : Announcing principal findings, Step 3 : Indicating RA structure. It can be seen from the Table (p. 9) that 17 papers contain Move 3 and three papers do not. Of the four options, Step 1A option is the most dominant (13 papers), followed by Step 1B (2 papers), Step 2 (1 paper), and Step 3 (1 paper). Lexical signals used in Move 3 are quite varied such as noun phrases (…this paper …, …in this study …, …this research …, …the objectives …, …the purpose …, …the rest of the paper …, etc.), verb phrases (…it is hoped…, … were to prepare …, … is to optimize …, …is organized…, … aims at …, … will be shown …, etc). The following are some examples of four options in Move 3 :

1. The objective of this study is to optimize geometrically the conical combustion chamber. (Step 1A; XVI-ITB)

2. This paper presents the thermal diffusivity of zirconia/iron composites measured using Laser Flash Method. (Step1B; VI-UGM)

3. The GDT method that has been utilized for analyzing the tolerance stacks will be demonstrated and some of its results will be shown in this paper (Step 2; XIII-ITB)

4. The rest of the paper is organized as follows. Section II explains the basic principle of synthesis imaging in VLBI. The widely used CLEAN and MEM deconvolution methods will be briefly reviewed in Section III. This section also explains the proposed CS-based deconvolution algorithm. Section IV describes simulation of visibility measurement for a configuration of observatories, inversion to obtain a dirty image, and compressive deconvolution results of synthetic astronomical radio source. CS based reconstruction of actual VLBI data is also described in this section. Section V concludes this paper and some remarks on CS-based synthesis imaging. (Step 3; XV-ITB)

In order to get a clear picture of how the moves are organized or ordered in the Introduction section, the following is a brief illustration of I-UDP :

In paper I-UDP Move 1 (Establishing a territory) containing Step 1 (Important Claim) can be found in paragraph 1. Step 1 (Claiming centrality) is directly put at the opening sentence (sentence 1) in paragraph 1 ("Output from the construction industry is a major and integral part of the national output, …") . In this move the author tries to show the importance of "construction industry as a national output". Step 3 (Reviewing items of previous research) which is obligatory can be seen in the whole section; it is spread in paragraphs 1, 2, 3, and 4. According to Swales (1990) it is one of the main aspects here the RA author should relate *what has been found* (or claimed) with *who has found it* (or claimed it) – an attribution to the research workers who published those results, and a stance towards the findings themselves. Swales distinguishes two types of attribution variables : integral and non-integral forms of citation. An integral citation is one which the name of the researcher occurs in the actual citing sentence as some

sentence- element; in non-integral citation, the researcher occurs either in parenthesis or is referred to elsewhere by a superscript number of via some other device. The Introduction section in paper 1-UDP contains 5 citations (1 integral and 4 non-integral forms); in this case, the use of non-integral forms is more dominant. The following are two kinds of citation found in paper I-UDP:

- **Lowe (2003) stated** that the value that the value added of construction is in the range of 7% to 10% for highly developed economies and around 3% to 6% for underdeveloped economies (figure 1). (Paragraph 1)

- For example, when it is recession and the number of unemployment is high, government uses the construction sector to increase the public expenditure **(Ball and Wood, 1994)**. (Paragraph 4)

Move 2 (Establishing a niche) Step 1B (Indicating a gap) in Paper I-UDP found in paragraph 5 is signaled by the words " … is not well understood. It needs methods to investigate …" (Paragraph 4) In reference to Swales (1990), Move 2 can be expressed in four choices or steps (counter claiming, indicating a gap, question raising, or continuing a tradition) and the writer in paper1-UDP chose Step 1B : Indicating a gap. While in Move 3 (Occupying the niche) the writer chooses Step 1A (Outlining the purpose) and is signaled by the words : "This paper elucidates, …."

D. CONCLUSIONS

This analysis focusing on the macro structure (rhetorical functions) in scientific research papers by non-native speakers has revealed the problems of scientific or academic writing in English by non-native speakers (Indonesian lecturers). The study has examined macro structure (discourse level) in the Introduction section. The results suggest that majority of the English research articles in the Introduction section by non-native speakers have not met the criteria or principles suggested by the experts representing Anglophone scientific work which has so far still dominated the publication of all scientific and technological information written in English. As a matter of fact, based on the Kaplan's (2000) and Mauranen's (2003) observation around 85% of such information is written in English and the number of non-native writers from developing countries who contribute in international journals is only 5% (Gibbs, 1995).

Rhetorical functions or communicative moves which occur in the data (Introduction sections) seem to be varied from paper to another, especially in the Non-IMRD papers. Pertinent to Swales' (1990) model the Introduction should contain three obligatory moves with optional several steps in a scientific research paper. In terms of the paper types (IMRD/Non-IMRD) the results show that at the average Non-IMRD papers seem to contain incomplete moves ranging from 2 to 3 moves; on the contrary, IMRD papers are likely to contain move complete moves.

A. RECOMMENDATIONS

This study has only been limited to the text analysis and, therefore, the understanding of tense choice is, to some extent, still partial (not holistic). The ideal one is supposed to be from at least the three parties (the researcher, the experts, and the research subjects, i.e. the journal authors). Since the approach of this research is limited to Genre Analysis, it is necessary to conduct other research which applies an ethnographic approach so that the knowledge of the strengths and weaknesses, the compliance or incompliance of the principles proposed by the linguists can be obtained.

Other research which is equally important is to delve further about the organizational features in Non-IMRD or theoretical papers since the journal publication may also accommodate such work, in spite of the fact that the first priority is still on the primary research based. Seeing the fact that the Anglophone writing has so far been a hegemony in the world of journal publication, the journal writers (faculty members) should be aware of and should comply to those principles of Anglophone writing style. In order to achieve the maximum results, the socialization of academic writing guidelines should be done as early as possible. Let's say, from the first year of study in the higher education.

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